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ENCLOSURES *(check all that apply)*

- ☒ Fee Transmittal Form
  - ☒ Fee Attached
- ☐ Amendment / Response
  - ☐ After Final
  - ☐ Affidavits/declaration(s)
- ☐ Extension of Time Request
- ☐ Express Abandonment Request
- ☐ Information Disclosure Statement
- ☐ Certified Copy of Priority Document(s)
- ☐ Response to Missing Parts/ Incomplete Application

- ☐ Assignment Papers *(for an Application)*
- ☐ Drawing(s)
- ☐ Licensing-related Papers
- ☐ Petition
- ☐ Petition to Convert to a Provisional Application
- ☐ Power of Attorney, Revocation Change of Correspondence Address
- ☐ Terminal Disclaimer
- ☐ Request for Refund
- ☐ CD, Number of CD(s)

- ☐ After Allowance Communication to Group
- ☐ Appeal Communication to Board of Appeals and Interferences
- ☒ Appeal Communication to Group *(Appeal Notice, Brief, Reply Brief)*
- ☐ Proprietary Information
- ☐ Status Letter
- ☒ Other Enclosure(s) *(please identify below)*:

  (1) Two additional copies of Appeal Brief; (2) Credit Card Payment form for $320.00; and (3) Return receipt postcard

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SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

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Signature		SEP 1 7 2003
Date	September 5, 2003	GROUP 3600

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I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below.

Typed or printed name	Denise E. Voris		
Signature	Denise E. Voris	Date	September 5, 2003

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:)
)
    Christopher L. Jones et al.)   Examiner: Dixon, Thomas A.
)
Application No: 09/495,982)   Art Unit: 3629
)
Filed: February 1, 2000)   Confirmation No.:   5534
)
For: FINANCIAL ADVISORY SYSTEM)
)

APPEAL BRIEF
IN SUPPORT OF APPELLANT'S APPEAL
TO THE BOARD OF PATENT APPEALS AND INTERFERENCES

Sir:

Applicant (hereafter "Appellant") hereby submits this Brief in triplicate in support of its

appeal from a decision by the Examiner, mailed March 5, 2003, in the above-referenced

application. Appellant respectfully requests consideration of this Appeal by the Board of Patent

Appeals and Interferences (the "Board") for allowance of the above-captioned patent application.

An oral hearing is not desired.

On September 4, 2003, the Appellant filed a Notice of Appeal (via facsimile) for the

present application. The present application includes claims that have now been twice rejected

by the Examiner. Therefore, this is a proper Appeal and Appellant's Brief in support of this

Appeal follows.

<u>Statement of the Substance of Telephonic Interview:</u>

As an initial matter pursuant to the *Manual of Patent Examining Procedure* § 713.04 (8th ed., rev. 1, 2003) (hereinafter "***MPEP***") and as requested by the Examiner in his Interview Summary mailed July 10, 2003, the Appellant will now provide a statement of the substance of a telephonic interview conducted among Examiner Thomas A. Dixon, Jason Scott, and the undersigned on July 8, 2003.

In an attempt to provide the Examiner with some context and understanding of the practical applications of various embodiments of the present invention, Mr. Scott and the undersigned began the telephone interview by providing an overview regarding the Financial Engines Investment Advisor® Service (available at: www.financialengines.com) which represents a highly successful[1] commercial service that embodies various aspects of the present invention. Mr. Scott and the undersigned explained that the Financial Engines Investment Advisor Service helps investors select among investment products/funds that are available to them via their respective 401(k), IRA, or other investment accounts, for example. Consequently, the service makes recommendations that are personalized and constrained by the financial products capable of being purchased by the individual investor to whom the recommendation is directed. Mr. Scott and the undersigned emphasized the difference between creating an investment product or an investment fund having broad applicability/appeal and offering personalized investment advice regarding optimization of a particular investor's portfolio.

The discussion then turned specifically to the teaching of US Patent No. 5,812,987 of Luskin et al. ("**Luskin**"). Mr. Scott and the undersigned explained that the disclosure of Luskin is generally directed to ***creating and managing an investment fund*** (e.g., a lifestyle fund) that

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[1] Fifteen financial institutions and 900 plan sponsors have hired Financial Engines to make advice available to over 3.2 million individuals.

represents an investment product *intended for a class of individuals* presumably having similar

investment horizons. In contrast, the methods and systems of the pending claims require

identification of a *recommended portfolio for a particular investor* (see, e.g., last element of

claim 1). Mr. Scott and the undersigned pointed out several passages in Luskin to support this

interpretation of Luskin's teachings, including the following:

- "An invention for managing assets in one or more investment funds" (see Abstract);
- "A time horizon H_t is associated with each [investment] fund F_n" (see Summary);
- "The investment mix of a[n] [investment] fund is strategically adjusted at periodic intervals..." (see Summary);
- "The present invention is a system and method for managing assets in investment funds wherein each fund has a fixed time horizon"(Col. 3, lines 33-35); and
- "The risk R of a fund F_n provides individual investors with information about the fund to assist tailoring their investments in accordance with their own risk preferences" (suggesting investors should perform manual tailoring of their investments for their needs – see Col. 4, lines 14-17).

Mr. Scott and the undersigned also explained to the Examiner that Figure 6 of Luskin

relates to adjusting the investment mix of an investment fund based on the length to its horizon

(i.e., step 522 of Figure 5).

Mr. Scott and the undersigned pointed out that a goal of the proposed Luskin

methodology is to create an investment fund that will be widely acceptable (e.g., tailored for a

class of individuals) (see Col. 7, line 55-58: "Optimizers 900 typically also include an upper

bound, which represents a maximum exposure that *any* investor wishes to have to one or more

asset classes or portfolios." (emphasis added)).

Mr. Scott and the undersigned then explained the mapping / exposure analysis recited by

the claims and described why Luskin has no need for such a mapping. Notably, it was pointed

out by Mr. Scott and the undersigned that since Luskin's approach creates a fund from scratch

and assumes investments can be made directly in various asset classes, Luskin has no constraints

with respect to financial products and their availability to particular investors. Rather, Luskin

purports to be able to create particular levels of exposure of its investment funds to particular

asset classes, such as "MSCI EAFE x-Japan" (see Table 1 at Col. 8) by simply purchasing the

asset classes directly in appropriate quantities to obtain the desired exposures. In contrast, the

methods and systems of the present invention are limited to identification of a recommended

portfolio of financial products that are "available" to the particular investor to whom the

financial advice to be rendered pertains. Consequently, the methods and systems of the present

invention *indirectly* create exposures to particular asset classes by way of the available financial

products; and hence the existence of the exposure analysis to create a mapping from the financial

product returns domain to the asset class returns domain.

Mr. Scott and the undersigned summarized the differences between the teachings of

Luskin and the mapping process used by the claims by explaining Luskin is composing a

lifestyle fund based upon a desired asset class mix while the mapping process of claim 1, for

example, essentially decomposes available financial products to allow them to be characterized

in terms of asset class exposures and to allow expected returns of various portfolios of the

available financial products to be determined based upon the characterization.

Mr. Scott and the undersigned reviewed the main points of distinction over Luskin by

walking the Examiner through at least the following elements of claim 1 thought be clearly

lacking from and not reasonably suggested by the teachings of Luskin: i) *"creating a mapping*

from each financial product of an available set of *financial products onto* one or more assets

classes of the plurality of *asset classes by determining exposures of the available set of*

financial products to each asset class" (emphasis added); ii) *"determining expected returns* and

volatility of returns *for* each of *a plurality of portfolios* [of financial products] on the efficient

frontier **based upon the mapping**" (emphasis added); and iii) "**identifying a recommended portfolio** [of financial products] ...that maximizes an expected utility of wealth **for a particular investor**" (emphasis added).

Much to the dismay of Mr. Scott and the undersigned and despite the compelling arguments for patentability over Luskin put forth by Mr. Scott and the undersigned, the Examiner indicated his intent to stand by the strained logic of his prior two rejections. The Examiner then inquired of the undersigned why the interview did not address his 35 U.S.C. § 101 rejection. When the Examiner was told the non-statutory subject matter rejection was not thought to be supported by current Federal Circuit precedent, he responded by pointing out that the Examiners were in the process of receiving additional training on this topic, but that his opinion was that recitation of specific hardware elements, such as processors and memories, would be required to overcome the non-statutory subject matter rejection.

While the undersigned's initial plan was to simply acquiesce to the Examiner's erroneous statutory subject matter analysis by submitting amended claims reciting processors and memories, equally unsupported positions with respect to 35 U.S.C. §§ 101, 112 and 120 were recently taken by the Examiner in a related pending application of the assignee. In view of the perceived pattern of unnecessary prosecution delays, the Appellant feels compelled to have these issues brought to the attention of and finally resolved by the Board.

REAL PARTY IN INTEREST

The real party in interest in this Appeal is Financial Engines, Inc., the assignee of all rights to the invention disclosed in the present application. The assignment of the inventors'

rights to Financial Engines, Inc. was recorded in the United States Patent and Trademark Office on November 14, 2000, at Reel 011311, Frame 0660.

RELATED APPEALS AND INTERFERENCES

There are no known appeals or interferences related to this Appeal.

STATUS OF CLAIMS

Claims 1-57 are currently pending in the above-referenced application. In the second Office action mailed March 5, 2003 (the "**Second Office Action**"), the Examiner (1) indicated claims 34-57 were subject to restriction requirement and withdrew them from consideration; (2) introduced for the first time a rejection of claims 1-30 under 35 U.S.C. § 101 as being directed to non-statutory subject matter; (3) rejected claims 1-3, 5-8, 10, 14-16, 18-21, 23-25, 27-33 for a second time under 35 U.S.C. §102(e) as being anticipated by Luskin; (4) rejected claims 4, 17 and 26 under 35 U.S.C. §103(a) as being unpatentable over Luskin in view of US Patent No. 5,848,287 of Edesess ("**Edesess**"); (5) rejected claims 9 and 22 under 35 U.S.C. §103(a) as being unpatentable over Luskin in view of US Patent No. 5,644,727 of Atkins ("**Atkins**"); and (6) indicated claims 11-13 would be allowable if rewritten to overcome the rejection under 35 U.S.C. § 101 and to include all of the limitations of the base claim and any intervening claims.

Claims 1-57 as set forth in the Amendment and Response to Office Action mailed December 27, 2002, are the subject of this Appeal. The Appendix of Claims below sets forth a copy of the appealed claims.

STATUS OF AMENDMENTS

No amendment has been filed subsequent to the Examiner's Second Office Action which rejected claims 1-10 and 14-33; and withdrew from consideration claims 34-57 as being directed to an invention purportedly independent or distinct from the invention originally claimed. A copy of all claims on appeal is attached hereto in the Appendix of Claims.

SUMMARY OF INVENTION

The systems and methods described and claimed in the above-referenced application generally relate to financial advisory services and seek to provide advice to an investor (directly or indirectly through a financial advisor) regarding feasible and optimal portfolio allocations among financial products available to the investor to achieve certain financial goals, such as a particular retirement standard of living, accumulating a down payment for the purchase of a house, or saving enough money to send a child to college. (Spec. pg. 1, lines 16-18; and pg. 8, lines 18-23).

Unlike prior art "retirement calculators," which require the end user to provide estimates of future inflation, interest rates and the expected return on investments, embodiments of the present invention model fundamental economic and financial forces. (Spec. pg. 2, lines 11-13; and pg. 7, line 13). Furthermore, unlike prior art programs that simply provide generic asset-allocation suggestions (typically in the form of a pie chart) that may or may not be attainable by a particular investor, embodiments of the present invention perform a portfolio optimization process (Fig. 3 reference numeral 340 and Fig. 7 reference numeral 750) to provide a recommended portfolio of financial products that are available to the investor. (Spec. pg. 2, lines 3-4; pg. 7, lines 8-12; and pg. 13, lines 23-25).

According to one embodiment, a factor model, implemented by the factor module 310, enables an assessment of how financial products and portfolios of financial products will respond to changes in returns of asset classes (aka factors) (see, e.g., Table 1, pg. 17) to which they are exposed. Return scenarios may be generated for each asset class of the factor model based upon future scenarios of one or more economic factors (e.g., price inflation, short-term interest rates, and dividend growth) (Spec. pg. 16, lines 2-6 and 21-26). Based on exposures of each financial product available to a particular investor to one or more of the asset classes of the factor model, a mapping may be created (e.g., a relationship identified) between the financial products and the factor model. In one embodiment, exposures of financial products to the factors is determined by returns-based style analysis. (Spec. pg. 18, line 21 to pg. 19, line 5; and EQ #4 on pg. 29). Given this relationship between the behavior of financial product returns relative to the returns of the factors, feasible investment scenarios may be generated and optimal portfolios may be recommended based upon the investor's expressed or implied utility function, including risk tolerance, investment horizon, and/or savings rate decisions. (Spec. pg. 7, lines 13-23; pg. 8, lines 1-18; pg. 12, lines 10-23; and pg. 33, lines 7-24).

ISSUES

A. Did the Examiner improperly withdraw claims 34-57 from consideration as being directed to a non-elected invention given the claims merely use different words to express substantially the same overall methodology as the originally presented invention of claims 1-33?

B. Did the Examiner improperly reject claims 1-30 under 35 U.S.C. § 101 as being directed to non-statutory subject matter based on a long rejected standard requiring use or manipulation of an apparatus rather than using the standards articulated by the *MPEP* (e.g., at § 2106(IV)(B)(2)(b)(ii)) and modern Federal Circuit case law, such as *AT&T Corp. v. Excel Communications, Inc.*, 172 F.3d 1352, 1358 (Fed. Cir. 1999) and *State Street Bank & Trust Co. v. Signature Fin.*

Group, Inc., 149 F.3d 1368, 1374-75, 47 USPQ2d 1596, 1602 (Fed.Cir.1998), *cert. denied*, 525 U.S. 1093, 119 S.Ct. 851, 142 L.Ed.2d 704 (1999)?

C.   Did the Examiner improperly reject claims 1-3, 5-8, 10, 14-16, 18-21, 23-25 and 27-33 under 35 U.S.C. § 102(e) by attributing capabilities and functionality to Luskin clearly unsupported by and outside of the scope and contemplation of its written description?

D.   Did the Examiner improperly reject claims 4, 17 and 26 under 35 U.S.C. 103(a) in view of the deficiencies of the primary reference, Luskin?

E.   Did the Examiner improperly reject claims 9 and 22 under 35 U.S.C. 103(a) in view of the deficiencies of the primary reference, Luskin?

GROUPING OF CLAIMS

In view of the issues presented and for purposes of this Appeal, Applicant groups the claims on appeal as follows:

Group I: Claim 1-33.

Group II: Claim 34-57.

ARGUMENT

A.   The Examiner has Improperly Withdrawn Claims 34-57 from Consideration as Being Directed to a Non-Elected Invention.

On December 27, 2002, the Appellant mailed an Amendment and Response under 37 C.F.R. § 1.111 which added new claims 34-57 (Claim Group II) thought to include similar limitations and thought to be generally directed to the same overall portfolio recommendation methodology as original claims 1-33 (Claim Group I). In the Second Office Action, the Examiner summarily dismissed claims 34-57 as being directed "to limitations which differ significantly from the originally presented claims ... and are seen to be three separate inventions,

combinations useable with the original invention, but distinct from it." (Second Office Action, pg. 3 ¶ 2). The Examiner then proceeded to paraphrase various elements of the claims in an apparent attempt to illustrate the use of different words in the claims and concluded such claims were withdrawn from consideration as being directed to a non-elected invention citing 37 C.F.R. 1.142(b) and *MPEP* § 821.03.

In accordance with Statute, the Commissioner may require restriction if two or more "independent and distinct" inventions are claimed in one application. 35 U.S.C. § 121. However, a proper requirement for restriction between patentably distinct inventions requires the Examiner to provide reasons and/or examples to support conclusions regarding the following: (i) the inventions must be independent or distinct as claimed; and (ii) there must be a serious burden on the Examiner. *MPEP* at § 803. The Appellant respectfully submits the Examiner has not made a *prima facie* showing with respect to either of the above-noted requirements. For example, with respect to the "serious burden" prong, the Examiner has not shown by appropriate explanation that the claims fall within separate classifications, have separate status in the art, or are in different fields of search. If the search and examination can be made without serious burden, the Examiner must examine the application on the merits, even though it includes claims to independent or distinct inventions. *MPEP* § 803. For at least this reason, the Appellant respectfully requests the Board to overrule the Examiner's conclusory restriction requirement.

With respect to the "independent or distinct as claimed" prong, the Examiner has not shown nor even made an effort to show that the purportedly different inventions claimed have no disclosed relationship. In fact, it is respectfully submitted that the claims of Claim Group II are closely related, in terms of operation and effect, to the originally filed claims, i.e., Claim Group I, and to each other as all the pending claims relate to the identification of a recommended

portfolio for a particular investor and include some kind of exposure analysis, albeit expressing the notion in different terms, to determine a relationship or mapping between the asset class domain and the financial product domain. For at least this additional reason, the Appellant respectfully requests the Board to overrule the Examiner's unsupported restriction requirement.

The Examiner's failure to support his restriction requirement by distinctly pointing out a basis for such restriction requirement has prejudiced the Appellant by, *inter alia*, unnecessarily delaying prosecution of this application and issuance of otherwise allowable claims, denying the Appellant of a prompt and complete examination of the present application, requiring this Appeal, and leaving Appellant to guess what might be the Examiner's reasons for such restriction requirement. The Appellant can only infer from Examiner's failure to explain his reasoning that no valid reason exists. In view of the unfairness that would otherwise come about, the Appellant respectfully requests the Board to direct the Examiner to either issue an action on the merits or allow the claims of Claim Group II in view of the previously performed prior art search carried out with respect to Claim Group I and the arguments for patentability presented below with respect to Claim Group I.

B.   The Examiner Applied a Long Rejected Standard in Making his Non-Statutory Subject Matter Rejection of Claims 1-30.

In the Second Office Action, the Examiner incorrectly rejected claims 1-30 (Claim Group I) under 35 U.S.C. § 101 as being directed to non-statutory subject matter. The Appellant respectfully disagrees and requests the Board to reverse the Examiner's mistaken conclusion in this regard as the claims of Claim Group I (and Claim Group II) are directed toward statutory subject matter and meet the Federal Circuit's definition of a "statutory process" under its

currently propounded 35 U.S.C. § 101 analysis in, *inter alia, AT&T Corp. v. Excel Communications, Inc.*, 172 F.3d 1352, 1358 (Fed. Cir. 1999).

The Federal Circuit in *AT&T* indicated a "claim is limited to a practical application [in the technological arts] when the method as claimed produce[s] *a concrete, tangible and useful result.*" *Id* at 1358 (emphasis added). Rather than applying this standard, the Examiner appears to have rejected the claims of Claim Group I on the long discredited theory that a statutory process requires an apparatus to be used or manipulated. Notably, the Federal Circuit rejected a similar position in *AT&T*, where the alleged infringer argued that "method claims containing mathematical algorithms are patentable subject matter only if there is a 'physical transformation' or conversion of subject matter from one state into another." *Id*. The court reasoned that "[t]he notion of 'physical transformation' can be misunderstood. In the first place, it is not an invariable requirement, but merely one example of how a mathematical algorithm may bring about a useful application." *Id*. The court reiterated its finding from *Arrhythmia Research Technology., Inc. v. Corazonix Corp.*, 958 F.2d 1053 (Fed. Cir. 1992): "that the claimed process 'transformed' data from one 'form' to another simply confirmed that Arrhythmia's method claims satisfied § 101 because the mathematical algorithm included within the process was applied to *produce a number which had specific meaning – a useful, concrete, tangible result – not a mathematical abstraction.*" *AT&T Corp.*, 172 F.3d at 1359 (emphasis added).

With respect to the Examiner's statement that "the method could be performed by the analysis of the human brain and utilizing word of mouth to identify the recommended portfolio," the Appellant respectfully disagrees. Even a cursory review of the present application should have revealed to the Examiner that the subject matter sought to be patented is a useful process involving a programmed computer (see pg. 9, lines 3-9; and Figure 2) and having practical

application at least in the context of a financial advisory system (see, e.g., pg. 9, lines 21-25; pg. 10, lines 2-7; pg. 15, lines 10-21; and Figures 1, 2, and 3). It is respectfully submitted that the methods recited by Claim Group I do not merely manipulate an abstract idea or perform a purely mathematical algorithm; instead, they have real world value in connection with providing financial advisory services and the like and "produce a useful, concrete, tangible result." *See AT&T Corp.*, 172 F.3d at 1359; *MPEP* § 2106(IV)(B)(2)(b)(ii). For example, the method of independent claim 1 includes "generating return scenarios for ... a plurality of asset classes ...; creating a mapping from ... [available] financial products onto ... asset classes ... by determining exposures ...; determining expected returns ... of a plurality of portfolios ... based upon the mapping; and identifying a recommended portfolio ... for a particular investor." Although no apparatus is specifically recited by claim 1, no apparatus is necessary as claim 1 describes a computer-related process limited to a practical application in the technological arts. *See MPEP* § 2106(IV)(B)(2)(b)(ii). In claim 1, the recited "recommended portfolio" is clearly analogous to a "number which has a specific meaning – a useful, concrete, tangible result." *See AT&T Corp.*, 172 F.3d at 1359. The recited "recommended portfolio" has a specific meaning and represents a useful, concrete and tangible result. Among other things, it provides the particular investor and/or his/her financial advisor, for example, with useful and meaningful information that allows specific and actionable investment decisions to be made in the context of the financial products available to the particular investor.

Similarly, independent claim 14 recites "a pricing kernel step for generating return scenarios for ... asset classes ...; a returns-based style analysis step for creating a mapping from ... [available] financial products onto ... asset classes ... by determining exposures ...; a step for determining expected returns ... of a plurality of portfolios ... based upon the mapping; and a

recommendation step for identifying a recommended portfolio ... for a particular investor."

Independent claim 23 requires "estimating returns for ... [available] financial products ...;

determining expected returns ... of a plurality of portfolios ...; and identifying a recommended

portfolio ... that maximizes a particular investor's utility function. ..."

While not presently rejected by the Examiner under 35 U.S.C. § 101 because of the

improper restriction requirement discussed earlier, similar arguments relating to an affirmative

finding of proper statutory subject matter exist for the claims of Claim Group II. For example,

independent claim 34 recites "determining feasible exposures to ... asset classes ... [for] a set of

financial products available to the particular investor ...; and identifying a recommended

efficient portfolio ... for the particular investor ..." Independent claim 44 requires "identifying a

relationship between ... [available] financial products ... and ... asset classes by performing an

exposure analysis ...; determining expected returns ... of the plurality of efficient portfolios ...;

and identifying a recommended portfolio ... for the particular investor." Independent claim 53

includes "a step for determining feasible exposures to a plurality of asset classes ...; and a step

for identifying a recommended efficient portfolio ..." Independent claim 55 recites "a step for

identifying a relationship between ... [available] financial products ... and ... asset classes; a

step for determining expected returns ... of a plurality of efficient portfolios ...; and a step for

identifying a recommended portfolio ..." Finally, independent claim 57 includes "forecasting

returns ...; identifying a relationship between [available] financial products ... and ... asset

classes; determining expected returns ... of a plurality of efficient portfolios ...; and identifying a

recommended portfolio ... for the particular investor."

These claim excerpts, though not the only evidence of compliance with 35 U.S.C. § 101,

demonstrate that the method claims of Claim Groups I and II qualify as statutory processes. The

claimed statutory processes of Claim Groups I and II clearly perform steps beyond mere abstract idea manipulation and describe computer-related processes having practical application as evidenced by the useful, concrete and tangible result produced in the form of a recommended portfolio that assists an investor or his/her advisor in making investment decisions relating to allocation of wealth among available financial products. Consequently, it should be abundantly clear that the recited methods satisfy the standard for statutory subject matter articulated by modern case law and the "Examination Guidelines for Computer-Related Inventions" set forth in *MPEP* § 2106. For at least these reasons, the method claims of Claim Groups I and II satisfy the appropriate standard for statutory processes under 35 U.S.C. § 101. Therefore, the Appellant respectfully requests the Board to reverse the Examiner's faulty 35 U.S.C. § 101 rejection of claims 1-30 and to prevent further delay in prosecution of this application by providing guidance to the Examiner regarding the existence of statutory subject matter with respect to the methods of Claim Group II.

C.   The Examiner Improperly Rejected Claims 1-3; 5-8, 10, 14-16, 18-21, 23-25 and 27-33 under 35 U.S.C. § 102(e) by Attributing to Luskin Functionality that is Neither Required, Taught, nor Reasonably Suggested by the Disclosure of Luskin.

The Examiner incorrectly rejected claims 1-3, 5-8, 10, 14-16, 18-21, 23-25 and 27-33 under 35 U.S.C. § 102(e) as being anticipated by Luskin. "A rejection for anticipation under section 102 requires that each and every limitation of the claimed invention be disclosed in a single prior art reference." *In re Paulsen*, 30 F.3d 1475, 1478-79 (Fed. Cir. 1994). Applying this standard for anticipation reveals that the Luskin reference has been misunderstood,

mischaracterized and/or misapplied by the Examiner. Careful analysis illustrates Luskin does not disclose each and every limitation expressly recited and required by the claims.

As presently understood by the undersigned, Luskin generally relates to an *investment fund* management method (see Title and Abstract). In managing an investment fund for a particular class of investors (e.g., those having a common horizon), Luskin teaches the investment mix of the fund among asset classes (see Table 1 in Col. 8) is adjusted (see 522 of Figure 5) as a function of a predetermined risk profile which assumes decreased risk tolerance as the length to the horizon decreases (see Col. 6, lines 33-46). Importantly, Luskin makes changes in the investment mix of the investment fund by physically purchasing or disposing of such asset classes directly (see Col. 8, lines 10-19). Such a situation significantly simplifies the task of portfolio optimization as when it is determined to be desirable to achieve particular exposure levels to particular asset classes, the assumption in Luskin is that one simply and conveniently purchases and/or disposes of an appropriate amount of such asset classes to achieve the desired exposures. Notably, this highly simplified scenario is neither practical nor useful when rendering personalized financial advice for a particular investor. Consequently, Luskin's simplified investment fund management environment is far removed from and nonanalogous to the context of the present invention in which portfolio recommendations are constrained to allocation of wealth among a plurality of financial products that are available to a particular investor.

Luskin does not contemplate and has no need for exposure analysis. As a result of the simplifying assumptions made by Luskin (e.g., no constraints on investments available for purchase/sale to build/reallocate the investment fund), Luskin has no need for performing

exposure analysis (e.g., creating a mapping between returns of the financial products available to a particular investor and returns of a plurality of asset classes).

Luskin creates and manages "lifestyle funds" and advocates is a one-size-fits-all, simplified investment vehicle for investors having similar time horizons rather than an individualized portfolio optimization approach as provided by various embodiments of the present invention. ***Luskin's suggested approach is the antithesis of personalized investment advice.*** Rather than evaluating financial products (e.g., stocks, bonds, mutual funds, etc.) available to a particular investor (e.g., via an employer sponsored 401(k) plan) and identifying a recommended portfolio of such available financial products for the particular investor, Luskin suggests that investors should invest in an off-the-rack investment fund that is designed to be widely acceptable to a broad class of investors that are assumed to have similar risk profiles as a result of their common investment horizons (even though their financial goals, savings rates, and true risk tolerances may vary considerably).

As evidenced by the prosecution history, the Examiner has incorrectly attributed functionality to Luskin that is clearly absent from the disclosure of Luskin. The Examiner then proceeded to use such attributed functionality to find anticipation under 35 U.S.C. § 102(e). For example, in the Second Office Action, the Examiner reiterated his mistaken belief that Luskin teaches "creating a mapping from each financial product of an available set of financial products onto one or more assets classes of the plurality of asset classes by determining exposures of the available set of financial products to each asset class" citing "Figure 6 (900) and column 7, line 47 – column 8, line 7." Notably, the item bearing reference numeral 900 in Figure 6 of Luskin is a box labeled "Optimize Portfolio." Meanwhile the portion of the written description of Luskin cited to support the Examiner's conclusion is equally deficient in terms of teaching or suggestion

regarding the recited exposure analysis. As far as the undersigned can comprehend, the only plausible explanation for the Examiner's reliance on the above-noted portion of Luskin in relation to the recited exposure analysis is the existence of the word "exposure" at Col. 7, lines 54 and 57. Presumably, the Examiner's electronic search of prior art for certain key words included the word "exposure" as one of the search terms. In all other respects, this portion of Luskin is completely irrelevant and unrelated to the recited exposure analysis performed by claim 1. The use of the term "exposure" in this portion of Luskin is in connection with the notion of providing an upper or lower bound on the amount invested in any particular asset class so as to promote the wide acceptability of the resulting investment fund. Neither this portion of Luskin nor any other portion of Luskin contemplate, teach or reasonably suggest creating a mapping from each of a plurality of financial products that are available to a particular investor onto one or more of a plurality of assets classes by determining exposures of the available financial products to each asset class. Again, such a discussion in the context of Luskin is superfluous in view of the simplifying assumptions made by Luskin. There is no need for the recited mapping when all the asset classes can be purchased directly and there are no constraints in terms of the available financial products for building an investment fund. For at least this reason, claim 1 and its dependents are thought to be distinguishable over Luskin.

Similar problems exist with respect to the Examiner's conclusion that Luskin discloses "*determining expected returns* and volatility of returns *for* each of *a plurality of portfolios* [of financial products] on the efficient frontier *based upon the mapping*" (Emphasis Added. See claim 1). As illustrated above, Luskin does not teach or reasonably suggest the mapping. It necessarily follows that Luskin cannot determine expected returns of portfolios based on such mapping. Turning to the Examiner's alleged support for this element in Luskin, the Examiner

points to "column 4, lines 26-43 and column 9, line 22 – column 10, line 30 and figures 5A-D" of Luskin. Again, there is no recognizable basis for application of the cited portions to the claim element at issue. Sadly, again, it appears reliance on a key word search and a lack of clear understanding of the portions relied upon caused this erroneous rejection. For example, various words in this claim element are present, such as a number of out-of-context occurrences of the terms "portfolio" and "portfolios" (see, e.g., Col. 4, lines 27, 32, 33, 37 and 43), "volatility" (see Col. 4, line 34-5), "expected return" (see, e.g., Col. 4, line 35). Meanwhile, the relevance of Figures 5A-D is unknown as they purport to depict the shift of risk tolerance over time for an investment fund. Similarly, Col. 9, line 22 to Col. 10, line 30 of Luskin, as above, includes some out-of-context usage of various terms in the recited element, such as "efficient frontier" (Col. 10, lines 22 and 23), but the Examiner's proposed application of the relied upon portion is unclear. In this latter portion of Luskin, all that is suggested is a conventional mean/variance optimization process involving multiple asset classes. Any further relevance escapes the undersigned. For at least this additional reason, claim 1 and its dependents are thought to be allowable over Luskin.

A further deficiency of the Luskin reference is in connection with the recited element of "*identifying a recommended portfolio* of the plurality of efficient portfolios that maximizes an expected utility of wealth *for a particular investor*" (Emphasis Added. See claim 1). As explained above, Luskin teaches creation of a widely acceptable investment fund that is not personalized or optimized for any investor; instead the investment fund is optimized for a particular time horizon and its underlying asset mix is dynamically adjusted based upon an assumed risk tolerance profile that is tied to the remaining life of the investment fund. For at least this further reason, claim 1 and its dependents are thought to be patentable over the teachings of Luskin.

As illustrated above, the remaining independent claims of Claim Group I and II contain limitations similar to those discussed with reference to claim 1. For at least this reason, these claims and their respective dependent claims are also thought to be allowable over Luskin.

D.   Since Edesess Does Not Address the Deficiencies of Luskin Noted Above with Reference to Claim 1, the Combination of Luskin and Edesess is Deficient in the Same Regard.

The Examiner improperly rejected claims 4, 17 and 26 under 35 U.S.C § 103(a) as being unpatentable over Luskin in view of Edesess. The Examiner relies on Edesess solely for allegedly teaching that "mean-variance optimization is an old and well known alternative for portfolio optimization." There is no need to address the correctness of the Examiner's assertion as the truth or falsity has no bearing on the relevance of the combination of Luskin and Edesess to the independent claims. Specifically, there is no teaching or suggestion in Edesess that addresses the deficiencies of Luskin pointed out above with respect to claim 1. Consequently, combining Edesess with Luskin provides no additional support for the Examiner's rejection thereby leaving the combination equally deficient with respect to the independent claims. For at least this reason, the claims of Claim Group I and II are distinguishable over the combination of Luskin and Edesess.

E.   Since Atkins Does Not Address the Deficiencies of Luskin Noted Above with Reference to Claim 1, the Combination of Luskin and Atkins is Deficient in the Same Regard.

The Examiner improperly rejected claims 9 and 22 under 35 U.S.C § 103(a) as being unpatentable over Luskin in view of Atkins. The Examiner relies on Atkins solely for allegedly

teaching "a stochastic process." There is no need to address the correctness of the Examiner's assertion as the truth or falsity has no bearing on the relevance of the combination of Luskin and Atkins to the independent claims. Specifically, there is no teaching or suggestion in Atkins that addresses the deficiencies of Luskin pointed out above with respect to claim 1. Consequently, combining Atkins with Luskin provides no additional support for the Examiner's rejection thereby leaving the combination equally deficient with respect to the independent claims. For at least this reason, the claims of Claim Group I and II are distinguishable over the combination of Luskin and Atkins

CONCLUSION
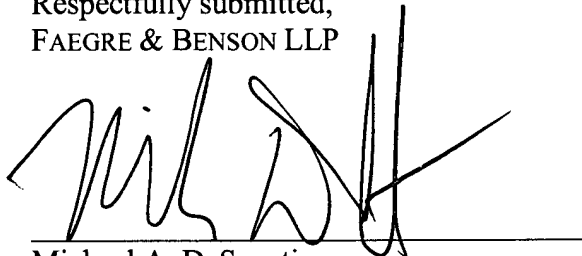
The Examiner has not put forth a *prima facie* case to support a restriction requirement for the closely related claims of Claim Group II. Consequently, the Examiner improperly withdrew claims 34-57 from consideration as being directed to a non-elected invention.

The Examiner improperly rejected claims 1-30 under 35 U.S.C. § 101 as being directed to non-statutory subject matter based on a long rejected standard requiring use or manipulation of an apparatus that is clearly at odds with current Federal Circuit precedent.

The combination of references relied upon by the Examiner (i.e., Luskin, Edesess and Atkins) do not individually or collectively teach or reasonably suggest at least three claim elements. The Examiner improperly attributed functionality to Luskin that is unsupported by, inconsistent with and outside the scope of the written description of Luskin. Meanwhile, neither Edesess nor Atkins address the deficiencies noted with respect to Luskin thereby leaving any combination equally lacking. For the aforementioned reasons, the Examiner's rejections should be reversed, and claims 1-57 should be allowed.

The appropriate fee of $320.00 for the filing and consideration of this Appeal Brief is enclosed. Should any additional fee be required, the Commissioner is authorized to charge our Deposit Account No. 06-0029 and requested to notify us of same.

Respectfully submitted,
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Date: <u>September 5, 2003</u>

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The claims on appeal read as follows:

1   1.   A method comprising:

2   generating return scenarios for each asset class of a plurality of asset classes based

3   upon future scenarios of one or more economic factors;

4   creating a mapping from each financial product of an available set of financial

5   products onto one or more asset classes of the plurality of asset classes by determining

6   exposures of the available set of financial products to each asset class of the plurality of

7   asset classes;

8   determining expected returns and volatility of returns for each of a plurality of

9   portfolios on the efficient frontier based upon the mapping, each of the plurality of

10   portfolios including combinations of financial products from the available set of financial

11   products; and

12   identifying a recommended portfolio of the plurality of efficient portfolios that

13   maximizes an expected utility of wealth for a particular investor.

1   2.   The method of claim 1, wherein the expected returns and the volatility of returns for each

2   of the plurality of portfolios on the efficient frontier are determined analytically.

1   3.   The method of claim 1, wherein the expected returns and the volatility of returns for each

2   of the plurality of portfolios on the efficient frontier are determined based upon a

3   simulation process.

1 4. The method of claim 1, wherein the particular investor's utility function comprises a

2 mean-variance utility function.

1 5. The method of claim 1, wherein said identifying a recommended portfolio assumes a

2 constant-mix strategy.

1 6. The method of claim 1, wherein said identifying a recommended portfolio assumes a

2 buy-and-hold strategy.

1 7. The method of claim 1, wherein the available set of financial products represents a set of

2 financial products offered through an employee-directed defined contribution plan.

1 8. The method of claim 7, wherein the available set of financial products comprises one or

2 more of bonds, stocks, and mutual funds.

1 9. The method of claim 1, wherein said generating return scenarios for each asset class of a

2 plurality of asset classes employs a model that incorporates a stochastic process that

3 limits the prices on the assets and payoffs in such a way that no arbitrage is possible.

1 10. The method of claim 1, wherein the plurality of asset classes includes a core set of asset

2 classes and a set of factor asset classes, and wherein the method further includes

3 conditioning the factor asset classes upon the core asset classes.

1 11. The method of claim 10, wherein said conditioning the factor asset classes upon the core

2 asset classes employs the following equation:

3 $$r_{it} = \alpha_i + \beta_{1i} ST\_Bonds_t + \beta_{2i} LT\_Bonds_t + \beta_{3i} US\_Stocks_t + \varepsilon_t$$

4 where,

5   r_{it} represents the return for a factor, i, at time t,

6   β_{ji} represents the sensitivity of the factor i to core asset class j,

7   *ST_Bonds*$_t$ represents the returns estimated for short-term US government bonds at time

8   t,

9   *LT_Bonds*$_t$ represents the returns estimated for long-term US government bonds at time

10   t.,

11   *US_Stocks*$_t$ represents the returns estimated for US stocks at time t,

12   α_i is a constant representing the average returns of factor asset class i relative to core

13   asset class exposures, and

14   ε_t is a residual random variable.

1   12.   The method of claim 11, further including imposing macroconsistency upon the factor

2   asset class returns by estimating α_i relative to a known efficient portfolio.

3   13.   The method of claim 12, wherein said imposing macroconsistency upon the factor asset

4   class returns includes calibrating α_i to be consistent with observed market weightings of

5   the factor asset classes associated with the Market Portfolio.

1   14.   A method comprising the steps of:

2   a pricing kernel step for generating return scenarios for each asset class of a

3   plurality of asset classes based upon future scenarios of one or more economic factors;

4   a returns-based style analysis step for creating a mapping from each financial

5   product of an available set of financial products onto one or more asset classes of the

6   plurality of asset classes by determining exposures of the available set of financial

7   products to each asset class of the plurality of asset classes;

8   a step for determining expected returns and volatility of returns for each of a

9   plurality of portfolios on the efficient frontier based upon the mapping, each of the

10   plurality of portfolios including combinations of financial products from the available set

11   of financial products; and

12   a recommendation step for identifying a recommended portfolio of the plurality of

13   efficient portfolios that maximizes an expected utility of wealth for a particular investor.

1   15.   The method of claim 14, wherein the expected returns and the volatility of returns for

2   each of the plurality of portfolios on the efficient frontier are determined analytically.

1   16.   The method of claim 14, wherein the expected returns and the volatility of returns for

2   each of the plurality of portfolios on the efficient frontier are determined based upon a

3   simulation process.

1   17.   The method of claim 14, wherein the particular investor's utility function comprises a

2   mean-variance utility function.

1   18.   The method of claim 14, wherein said recommendation step assumes a constant-mix

2   strategy.

1   19.   The method of claim 14, wherein said recommendation step assumes a buy-and-hold

2   strategy.

1   20.   The method of claim 14, wherein the available set of financial products represents a set of

2   financial products offered through an employee-directed defined contribution plan.

1   21.   The method of claim 20, wherein the available set of financial products comprises one or

2   more of bonds, stocks, and mutual funds.

1   22.   The method of claim 14, wherein said pricing kernel step employs a model that

2   incorporates a stochastic process that limits the prices on the assets and payoffs in such a

3   way that no arbitrage is possible.

1   23.   A method comprising:

2   estimating returns for each financial product of an available set of financial

3   products based upon the financial product's sensitivity to movements of a plurality of

4   predetermined economic factors by utilizing a factor model;

5   determining expected returns and volatility of returns for each of a plurality of

6   portfolios on the efficient frontier for the available set of financial products, the plurality

7   of portfolios each including one or more financial products of the available set of

8   financial products; and

9   identifying a recommended portfolio of the plurality of portfolios that maximizes

10   a particular investor's utility function at a predetermined time horizon taking into

11   consideration the timing and amount of expected contributions and expected withdrawals,

12   if any.

1   24.   The method of claim 23, wherein the expected returns and the volatility of returns for

2   each of the plurality of portfolios on the efficient frontier are determined analytically.

1   25.   The method of claim 23, wherein the expected returns and the volatility of returns for

2   each of the plurality of portfolios on the efficient frontier are determined based upon a

3   simulation process.

1   26.   The method of claim 23, wherein the utility function comprises a mean-variance utility

2   function.

1   27.   The method of claim 23, wherein said identifying a recommended portfolio assumes a

2   constant-mix strategy.

1   28.   The method of claim 23, wherein said identifying a recommended portfolio assumes a

2   buy-and-hold strategy.

1   29.   The method of claim 23, wherein the available set of financial products represents a set of

2   financial products offered through an employee-directed defined contribution plan.

1   30.   The method of claim 29, wherein the available set of financial products comprises one or

2   more of bonds, stocks, and mutual funds.

1   31.   A financial advisory system comprising:

2   a forecasting means for generating return scenarios for each asset class of a

3   plurality of asset classes based upon future scenarios of one or more economic factors;

4   a fund decomposition means, communicatively coupled to the forecasting means,

5   for creating a mapping from each financial product of an available set of financial

6   products onto one or more asset classes of the plurality of asset classes by determining

7 exposures of the available set of financial products to each asset class of the plurality of

8 asset classes;

9 a means, communicatively coupled to both the forecasting means and the fund

10 decomposition means, for determining expected returns and volatility of returns for each

11 of a plurality of portfolios on the efficient frontier based upon the mapping, each of the

12 plurality of portfolios including combinations of financial products from the available set

13 of financial products; and

14 a portfolio optimization means for identifying a recommended portfolio of the

15 plurality of efficient portfolios that maximizes an expected utility of wealth for a

16 particular investor based on the expected returns and the volatility of returns.

1 32. A computer system comprising:

2 a storage device having stored therein a portfolio optimization routine to

3 determine portfolio return scenarios for one or more portfolios including combinations of

4 financial products from an available set of financial products and identify a recommended

5 portfolio;

6 a processor coupled to the storage device to execute the portfolio optimization

7 routine to generate asset class return scenarios, a mapping, portfolio return scenarios, and

8 identify the recommended portfolio, where:

9   the asset class return scenarios are generated for each asset class of

10 a plurality of asset classes based upon future scenarios of one or more

11 economic factors;

12   the mapping associates each financial product of the available set

13 of financial products with one or more asset classes of the plurality of

14   asset classes, the mapping is generated by determining exposures of the

15   available set of financial products to each asset class of the plurality of

16   asset classes;

17   the portfolio return scenarios are generated by determining

18   expected returns and volatility of returns for each of a plurality of

19   portfolios on the efficient frontier based upon the mapping, each of the

20   plurality of portfolios including combinations of financial products from

21   the available set of financial products; and

22   the recommended portfolio is identified by determining a portfolio

23   of the plurality of efficient portfolios that maximizes an expected utility of

24   wealth for a particular investor.

1   33.   A machine-readable medium having stored thereon data representing sequences of

2   instructions, said sequences of instructions which, when executed by a processor, cause

3   said processor to:

4   estimate returns for each financial product of an available set of financial products

5   based upon the financial product's sensitivity to movements of a plurality of

6   predetermined economic factors by utilizing a factor model;

7   determine expected returns and volatility of returns for each of a plurality of

8   portfolios on the efficient frontier for the available set of financial products, the plurality

9   of portfolios each including one or more financial products of the available set of

10   financial products; and

11   identify a recommended portfolio of the plurality of portfolios that maximizes a

12   particular investor's utility function at a predetermined time horizon taking into

13   consideration the timing and amount of expected contributions and expected withdrawals,

14   if any.

1   34.   A method comprising:

2   determining feasible exposures to a plurality of asset classes achievable by a

3   particular investor by determining a combination of one or more asset classes and

4   proportions thereof that characterize future performance of each financial product of a set

5   of financial products available to the particular investor for investment; and

6   identifying a recommended efficient portfolio of financial products from the set of

7   financial products by maximizing an expected utility of wealth for the particular investor

8   based upon the feasible exposures.

1   35.   The method of claim 34, further comprising modeling expected future asset class returns

2   as a function of one or more economic factors by generating return scenarios for each

3   asset class of the plurality of asset classes based upon future scenarios of the one or more

4   economic factors.

1   36.   The method of claim 34, wherein said determining a combination of one or more asset

2   classes and proportions thereof that characterize future performance of each financial

3   product of a set of financial products comprises performing returns-based style analysis.

1   37.   The method of claim 34, wherein said determining a combination of one or more asset

2   classes and proportions thereof that characterize future performance of each financial

3   product of a set of financial products comprises surveying the underlying assets held in

4   the financial product.

1 38. The method of claim 34, wherein said determining a combination of one or more asset

2 classes and proportions thereof that characterize future performance of each financial

3 product of a set of financial products comprises obtaining exposure information based on

4 a target benchmark associated with the financial product.

1 39. The method of claim 34, wherein said determining a combination of one or more asset

2 classes and proportions thereof that characterize future performance of each financial

3 product of a set of financial products comprises categorizing exposures based on standard

4 industry classification schemes.

1 40. The method of claim 34, further comprising forecasting the probability of the particular

2 investor meeting an identified financial goal based upon the recommended efficient

3 portfolio.

1 41. The method of claim 34, further comprising receiving information indicative of the

2 particular investor's risk tolerance.

1 42. The method of claim 41, wherein said maximizing an expected utility of wealth for the

2 particular investor comprises determining expected returns and volatility of the expected

3 returns for each of a plurality of efficient portfolios comprising a combination of one or

4 more financial products from the set of financial products based upon said determining a

5 combination of one or more asset classes and proportions thereof that characterize future

6 performance of each financial product.

1   43.   The method of claim 34, wherein the set of financial products available to the particular

2   investor for investment comprises financial products offered through an employee-

3   directed defined contribution plan.

1   44.   A method comprising:

2   identifying a relationship between returns of each financial product of a set of

3   financial products that are available to a particular investor for investment and returns of

4   combinations of one or more factor asset classes of a set of factor asset classes by

5   performing an exposure analysis on each financial product of the set of financial products;

6   determining expected returns and volatility of returns for each of a plurality of

7   efficient portfolios based upon the relationship, each of the plurality of efficient portfolios

8   including a combination of one or more of the financial products from the set of financial

9   products; and

10   identifying a recommended portfolio of the plurality of efficient portfolios by

11   selecting an efficient portfolio of the plurality of efficient portfolios that maximizes an

12   expected utility of wealth for the particular investor.

1   45.   The method of claim 44, further comprising:

2   forecasting returns associated with each core asset class of a set of core asset

3   classes by generating core asset class scenarios based upon future scenarios of one or

4   more economic factors with an equilibrium econometric model; and

5   forecasting returns associated with each factor asset class of the set of factor asset

6   classes by generating factor model asset scenarios based upon the core asset class

7   scenarios;

1   46.   The method of claim 44, wherein said performing an exposure analysis on each financial

2   product of the set of financial products comprises performing returns-based style

3   analysis.

1   47.   The method of claim 44, wherein said performing an exposure analysis on each financial

2   product of the set of financial products comprises surveying the underlying assets held in

3   the financial product.

1   48.   The method of claim 44, wherein said performing an exposure analysis on each financial

2   product of the set of financial products comprises obtaining exposure information based

3   on a target benchmark associated with the financial product.

1   49.   The method of claim 44, wherein said performing an exposure analysis on each financial

2   product of the set of financial products comprises categorizing exposures based on

3   standard industry classification schemes.

1   50.   The method of claim 44, further comprising forecasting the probability of the particular

2   investor meeting an identified financial goal based upon the recommended efficient

3   portfolio.

1   51.   The method of claim 44, further comprising receiving information indicative of the

2   particular investor's risk tolerance, and wherein said maximizing an expected utility of

3   wealth for the particular investor takes into consideration the information indicative of

4   the particular investor's risk tolerance and information regarding expected returns and

5   volatility of the expected returns for each of a plurality of efficient portfolios comprising

6   a combination of one or more financial products from the set of financial products that is

7   generated based upon the relationship.

1   52.   The method of claim 44, wherein the set of financial products available to the particular

2   investor for investment comprises financial products offered through an employee-

3   directed defined contribution plan.

1   53.   A method comprising:

2   a step for determining feasible exposures to a plurality of asset classes achievable

3   by a particular investor based upon a set of financial products available to the particular

4   investor for investment; and

5   a step for identifying a recommended efficient portfolio of financial products from

6   the set of financial products.

1   54.   The method of claim 53, further comprising a step for modeling expected future asset

2   class returns as a function of one or more economic factors;

1   55.   A method comprising:

2   a step for identifying a relationship between returns of each financial product of a

3   set of financial products that are available to a particular investor for investment and

4   returns of combinations of one or more factor asset classes of a set of factor asset classes;

5   a step for determining expected returns and volatility of returns for each of a

6   plurality of efficient portfolios based upon the relationship, each of the plurality of

7 efficient portfolios including a combination of one or more of the financial products from

8 the set of financial products; and

9   a step for identifying a recommended portfolio of the plurality of efficient

10 portfolios.

1 56. The method of claim 57, further comprising:

2   a step for forecasting returns associated with each core asset class of a set of core

3 asset classes by generating core asset class scenarios based upon future scenarios of one

4 or more economic factors with an equilibrium econometric model; and

5   a step for forecasting returns associated with each factor asset class of the set of

6 factor asset classes based upon the core asset class scenarios

1 57. A method comprising:

2   forecasting returns associated with each core asset class of a set of core asset

3 classes by generating core asset class scenarios based upon future scenarios of one or

4 more economic factors with an equilibrium econometric model;

5   forecasting returns associated with each factor asset class of a set of factor asset

6 classes by generating factor model asset scenarios based upon the core asset class

7 scenarios;

8   identifying a relationship between future returns of each financial product of a set

9 of financial products that are available to a particular investor for investment and future

10 returns of combinations of one or more factor asset classes of the set of factor asset

11 classes by determining each financial product's effective asset mix with respect to the set

12 of factor asset classes;

13   determining expected returns and volatility of returns for each of a plurality of

14 efficient portfolios based upon the relationship, each of the plurality of efficient portfolios

15 including a combination of one or more of the financial products from the set of financial

16 products; and

17   identifying a recommended portfolio of the plurality of efficient portfolios by

18 selecting an efficient portfolio of the plurality of efficient portfolios that maximizes an

19 expected utility of wealth for the particular investor.